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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,477	08/07/2001	Chih-Ming Ho	510015-235	1523

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EXAMINER

SOOHOO, TONY GLEN

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 01/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,477

Applicant(s)

HO ET AL.

Examiner

Tony G Soohoo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 3,4 and 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-12 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-2, 5-7, 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Batchelder 4390403.

Batchelder teaches a mixing device 56, 86 having a means (electrodes 12, 14, 16, 18, 32, 42,) which is capable for crating a time varying electrical field (changes from positive voltage, to zero, to negative voltage) for inducing the movement fluids which should 1st and 2nd chemical materials be introduced together, via dielectrophoretic forces causes mixing by "dielectropheretically driven from one side of the reservoir to the other in order to mix the different solutions" such that an interface between the two materials are caused to interact at a rate than mere interface diffusion alone, column 8, lines 51-64, see especially claims 1, 2, 16, 17, 20 of the claims of Batchelder. Note that the force field would cross transverse to the body of the fluid along the axis of the channel, see positive and negative charges are disposed transverse to the body such that the magnetic field formed would be transverse to the body of material as the fluid is driven from one side to another . The opposite positive and negative charges are disposed in opposite top to bottom positioning thereby causing perturbation of charged fluid as the positive and negative charges are switched to cause the axial flow, thus a combined motion of an perturbed axial flow and a perturbed transverse motion is achieved at any interface of fluid components as the fluid is driven from one side to the

other. With regards to newly added claims 24, note that the operation of the electrodes 18 and 14 the electrodes alternate from 1st negative voltage to a 2nd positive voltage as seen in the modes 1-9 of figure 2A.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-12, 18-19 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Batchelder 4390403.

With regards to claims 8-12, and 18-19, these claims point out the manner of the production of the electrical field force angle in a frequency application relative to the material, whereas the claims are apparatus claims, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987). Whereas that the Batchelder reference shows a channel 6, and electrodes 12, 14, 16, 18, 32, 42 with a control feature which are capable of providing a transverse perturbed field which the apparatus may then perform mixing, it is deemed that the device as taught by the Batchelder reference as anticipating the claimed limitations of claims 8-12, 18 and 19.

However, in argument, it may be argued that the reference does not particular state a transverse force produced by the electrodes relative to the fluids and the particular alternating of voltage at frequency of the field.

Note that voltage is perturbed to provide changes to the material as seen in column 4, lines 10-55, column 5, lines 47-57, and especially column 8, lines 60-64, but does not state the orientation of the field being transverse nor the fluctuations of the voltages at a frequency as stated by the claims.

Batchelder discloses the claimed invention except for the orientation of the field and the frequency of the voltage which is perturbed to provide changes to the material, see column 8, lines 60-64. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, In re Aller, 105 USPQ 233, it is deemed that it would have been obvious to one of ordinary skill in the art to modify the perturbation of the voltage (i.e. frequency) between the electrodes to at an effective transverse force.

With regards to the force angle Batchelder discloses the claimed invention except for the force angle of the field produced. since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980), it would have been obvious to one having ordinary skill in the art at the time the invention was made modify the electrode or field strength to produce a force angle to produce a more effective movement of the fluids for processing.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder 4390403 in view of Nordman 6176991.

With regards to claims 20, the Batchelder reference discloses all of the recited subject matter as defined within the scope of the claims with the exception of chamber being an open chamber. It appears that the chamber shown appears to be a tube 24, (closed).

The reference to Nordman teaches that is was known in the state of the art at a channel utilizing electrophoresis may be configured as an closed channel via a top 23, or an open channel, see column 4, lines 7-9.

In view of common knowledge of the state of the art as shown by the example to Nordman that one may use electrophoresis channels configured as an closed channels or open channels, it is deemed that it would have been obvious to one of ordinary skill in the art to modify the structure of Bachelder with an open top channel as shown by Nordman so that the construction of the device may be made more easily.

5. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kindlmann 4911817 (previously cited on PTO 892.

Kindlmann teaches a device having a channel 24, 28, 22, 20, whereby plural electrodes i.e. "driving electrodes" provides an electrophoresis motion in different directions thereby being transverse in effect in a radial manner as seen by driving electrodes Dn (D1-D24) whereby the electrodes may be driven in different modes,

voltages or frequencies for a desired effect in the change of the varying field in time, see column 8 lines 49-55, and lines 59-62. and column 9, lines 37-50.

Kindlmann discloses all of the recited subject matter as defined within the scope of the claims with the exception of the channel 20 being a "microchannel", i.e. and without the 2nd electrodes later operated in a operation of the 1st electrode is modulated in frequency or voltage and the 2nd electrode is not modulated.

With regards to the channel being a microchannel, the Kindlmann does disclose a channel for laboratory use. Whereas a microchannel is known in the use of laboratory equipment and is desirable for the advantages of a smaller size thereby reducing the economical use of supplies for a process, and whereby techniques for fabrication of a microchannel for the use of fluid processing is known in the art of MEMS technology, It is deemed that it would have been obvious to one of ordinary skill in the art to change the size of the channel of the Kindlmann device to a smaller microchannel device so that the lesser materials is used in the process so that the device would be more economical in the use of the supply fluids to be mixed. It is noted that a change in size is generally recognized as being within the level of ordinary skill in the art, In re Rose, 105 USPQ 237 (CCPA 1955).

With regards to the modes of operation and frequencies of a 1st and 2nd electrodes. It is noted above that each driving electrode may be independently driven. Also, has also been discussed by Kindlmann that the electric field may be controlled in amplitude or angle (i.e. phase frequency), to produce a desired effect. Accordingly, without undue experimentation as discussed by Kindlmann, it is deemed that it would

have been obvious to one of ordinary skill in the art to adjust the amplitude and/or phase frequency angle between each of the driving electrodes in order to produce a more effective operation in driving the fluids to produce a desired effect.

It is noted that the claims are directed to an apparatus, and that the manner of operation of a process does not patentable distinguish structural claims.

Response to Arguments

6. Applicant's arguments filed 09-30-2003 have been fully considered but they are not persuasive. Applicant argues that the Batchelder does not state a "specific mixing process" (pg 6, 4th paragraph) and that "[f]urthermore, nowhere is the aspect of homogenous mixing" disclosed (pg 6, paragraph 5) and that applicant believes that the time-varying electrical field applied by the electrodes of the Batchelder '403 reference is "insufficient to induce mixing" (pg 6, paragraph 5).

7. In response, the claims are apparatus claims. Issues to a mixing process and "homogenous" mixing are directed to the intended use and end effect of the structure. In anticipation of the claims, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Nonetheless, it is further noted that the manipulation of chemical species as taught by the '403 reference produces a some degree a "mixing" effect which may although may not be the primary outcome, a "mixing" occurs between the components

that is an effect of moving the different components in a driven intermingling of the other as it is pulled through the other using the time varying field.

8. With regards to the argument that the electrodes are inside the channel, this is a new structural feature recited in the new claims 24 and 25 and has been addressed by the previously cited reference of Kindimann showing a channel 20 defined by walls 26, 22, 28, 24, which holds a materials in the channel whereby electrodes are placed to produce a time varying field to affect the motion of the displacement of sample components in which mixing may be produced by appropriate control of the independently controllable electrodes.

Conclusion

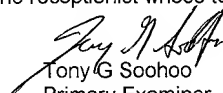
9. Applicant's amendment with an addition of new claims 24 and 25 has necessitated the new ground(s) of rejection presented in this Office action with regards to the newly added claims. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony G Soohoo whose telephone number is (571) 272 1147. The examiner can normally be reached on 7:00 AM - 5:00 PM, Tues. - Fri.. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Tony G Soohoo
Primary Examiner
Art Unit 1723

tgs